

What is claimed is:

1. A method to support displaying management information in a graphical user interface, the method comprising:
  - 5 displaying a management information view that includes management information associated with at least one managed entity in a network;  
displaying a drill down menu associated with the management information view, the drill down menu including selectable drill down options that correspond to respective drill down functions selectively applied to the management  
10 information associated with the at least one managed entity;  
identifying a selected drill down option chosen from the drill down menu;  
producing a drill down view by applying the respective drill down function associated with the selected drill down option to the management information associated with the at least one managed entity, the produced drill  
15 down view including a presentation of the management information based on the applied respective drill down function; and  
displaying the drill down view on the graphical user interface.
2. A method as in claim 1, wherein the respective drill down function associated  
20 with the selected drill down option identifies a particular category in which to drill down to a lower level with respect to the management information associated with the at least one managed entity.
3. A method as in claim 2, wherein displaying a drill down menu includes:
  - 25 displaying the drill down menu to include drill down options associated with managed entities in a storage area network, the drill down menu including at least one of the following drill down options: database, database file, file system, volume group, host device, HBA (Host Bus Adapter), storage device, pool, port/storage group, unallocated devices.

4. A method as in claim 1, wherein displaying a management information view includes:

receiving a selection of at least one managed entity icon representing a corresponding at least one managed entity in the network;

- 5 receiving a selection of a type of management information view in which to display management information associated with managed entities represented by the selected at least one managed entity icon; and

10 based on the selection of a type of management information view, applying a display function to the management information associated with the at least one managed entity in the network to graphically display the management information associated with the selected at least one managed entity icon.

5. A method as in claim 1, wherein displaying a management information view includes:

15 maintaining a database of managed objects associated with managed entity icons, the managed entity icons corresponding to managed entities of a storage area network; and

20 upon detecting selection of at least one managed entity icon for producing a management information view, retrieving at least one corresponding managed object stored in the database associated with the selected at least one managed entity icon to identify the management information associated with the selection of the at least one managed entity icon.

6. A method as in claim 1 further comprising:

25 allocating a first portion of a display screen to include a hierarchy of selectable icons representing managed entities of a storage area network;

allocating a second portion of the display screen to include the management information view associated with the at least one managed entity in the network;

allocating a third portion of the display screen to display a detailed view including separately listed entries of management information for each of the at least one managed entity in the network displayed in the second portion of the display screen; and

5 allocating a fourth portion of the display screen to include the drill down menu.

7. A method as in claim 1 further comprising:

10 in relation to the management information view including management information associated with the at least one managed entity in the network, displaying a detailed view of individually presented management information for each of the at least one managed entities.

8. A method as in claim 7, wherein the management information in the management information view includes a single graph of collective management information associated with multiple managed entities of the network.

9. A method as in claim 7 further comprising:  
20 providing corresponding icons on the display screen to enable a user to selectively hide the management information view.

10. A method as in claim 1, wherein the management information in the management information view includes a single graph of collective management information associated with the at least one managed entity.

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11. A method as in claim 1 further comprising:

displaying path information in relation to the management information view, the path information including: i) an entry corresponding to a present drill down level view of the displayed management information in the management

view, and ii) at least one entry of a previous drill down level view of previously displayed management information.

- 5 12. A method as in claim 11, wherein the at least one entry of the previous drill down level view may be selected by a user to change contents of the management information view back to a corresponding previously displayed management information view.
- 10 13. A method as in claim 1 further comprising:  
highlighting a subset of drill down options in the drill down menu depending on which of the drill down options may be selected by a user to produce a next displayable drill down view.
- 15 14. A method as in claim 1 further comprising:  
displaying a hierarchy of managed entity icons that may be traversed based on use of a drill down technique; and  
in relation to at least a portion of the managed entity icons in the hierarchy, providing a display region in relation to the managed entity icons to receive an input selection by a user of which management information to display  
20 for multiple selected managed entities of the network.
- 25 15. A method as in claim 1, wherein the drill down menu includes at least two sets of selectable drill down options, a first set of selectable drill down options related to storage features of a storage area network, a second set of drill down options related to host features of the storage area network.
16. A method as in claim 1 further comprising:  
in relation to the management information view including management information associated with the at least one managed entity in the network,

displaying a detailed view of individually presented management information for each of the at least one managed entities;

enabling a user to individually select each of the at least one managed entity in the detailed view; and

5            wherein producing a drill down view further includes applying the respective drill down function to management information associated with individually selected managed entities displayed in the detailed view.

10        17. A method of displaying management information on a display screen, the method comprising:

on a first portion of the display screen, displaying a vertical hierarchy of selectable icons representing managed entities of a storage area network;

15            on a second portion of the display screen, displaying a summary view of collective management information associated with at least two selected managed entities of the storage area network;

on a third portion of the display screen, displaying a detailed view of separately listed management information for each of the at least two selected managed entities in the network; and

20            on a fourth portion of the display screen, displaying a drill down menu including multiple selectable drill down options to drill down with respect to at least a portion of the management information displayed in the detailed view of separately listed management information.

18. A method as in claim 17, wherein displaying a drill down menu includes:  
25            displaying the drill down menu to include drill down options associated with managed entities in a storage area network, the drill down menu including at least one of the following drill down options to drill down to a corresponding lower level with respect to displayed management information: database, database file, file system, volume group, host device, HBA (Host Bus Adapter), storage  
30            device, pool, port/storage group, unallocated devices.

19. A method as in claim 17, wherein the drill down menu includes at least two sets of selectable drill down options, a first set of selectable drill down options related to storage features of a storage area network, a second set of drill down options related to host features of the storage area network.
20. A method as in claim 17 further comprising:  
on a fourth portion of the display screen, displaying path information path information including: i) an entry corresponding to a drill down view of presently displayed management information, and ii) at least one entry corresponding to a previously displayed drill down view of management information.
21. A computer system supporting management information views associated with a storage area network, the computer system comprising:  
a processor;  
a memory unit that stores instructions associated with an application executed by the processor;  
a communication interface that supports communication with other nodes of the storage area network; and  
an interconnect coupling the processor, the memory unit, and the communication interface, enabling the computer system to execute the application and perform operations of:  
displaying a management information view that includes management information associated with at least one managed entity in a network;  
displaying a drill down menu associated with the management information view, the drill down menu including selectable drill down options that correspond to respective drill down functions selectively applied to the management information associated with the at least one managed entity;

identifying a selected drill down option chosen from the drill down menu;

producing a drill down view by applying the respective drill down function associated with the selected drill down option to the management information associated with the at least one managed entity, the produced drill down view including a presentation of the management information based on the applied respective drill down function; and

displaying the drill down view on the graphical user interface.

10 22. A computer system as in claim 21, wherein the respective drill down function associated with the selected drill down option identifies a particular category in which to drill down to a lower level with respect to the management information associated with the at least one managed entity.

15 23. A computer system as in claim 22, wherein displaying a drill down menu includes additional operations of:

displaying the drill down menu to include drill down options associated with managed entities in a storage area network, the drill down menu including at least one of the following drill down options to drill down to the lower level:  
20 database, database file, file system, volume group, host device, HBA (Host Bus Adapter), storage device, pool, port/storage group, unallocated devices.

24. A computer system as in claim 21, wherein displaying a management information view includes additional operations of:

25 receiving a selection of at least one managed entity icon representing a corresponding at least one managed entity in the network;

receiving a selection of a type of management information view in which to display management information associated with managed entities represented by the selected at least one managed entity icon; and

based on the selection of a type of management information view,  
applying a display function to the management information associated with the at  
least one managed entity in the network to graphically display the management  
information associated with the selected at least one managed entity icon.

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25. A computer system as in claim 21, wherein displaying a management information  
view includes additional operations of:

maintaining a database of managed objects associated with managed entity  
icons, the managed entity icons corresponding to managed entities of a storage  
area network; and

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upon detecting selection of at least one managed entity icon for producing  
a management information view, retrieving at least one corresponding managed  
object stored in the database associated with the selected at least one managed  
entity icon to identify the management information associated with the selection  
of the at least one managed entity icon.

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26. A computer system as in claim 21 that additionally performs operations of:

allocating a first portion of a display screen to include a hierarchy of  
selectable icons representing managed entities of a storage area network;

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allocating a second portion of the display screen to include the  
management information view associated with the at least one managed entity in  
the network;

allocating a third portion of the display screen to display a detailed view  
including separately listed entries of management information for each of the at  
least one managed entity in the network displayed in the second portion of the  
display screen; and

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allocating a fourth portion of the display screen to include the drill down  
menu.

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27. A computer system as in claim 21 that additionally performs operations of:



in relation to the management information view including management information associated with the at least one managed entity in the network, displaying a detailed view of individually presented management information for each of the at least one managed entities.

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28. A computer system as in claim 27, wherein the management information in the management information view includes a single graph of combined management information associated with multiple managed entities of the network.

10 29. A computer system as in claim 27 that additionally performs operations of:  
providing corresponding icons on the display screen to enable a user to selectively hide the management information view.

15 30. A computer system as in claim 21, wherein the management information in the management information view includes a single graph of collective management information associated with the at least one managed entity.

20 31. A computer system as in claim 21 that additionally performs operations of:  
displaying path information in relation to the management information view, the path information including: i) an entry corresponding to a present drill down level view of the displayed management information in the management view, and ii) at least one entry of a previous drill down level view of previously displayed management information.

25 32. A computer system as in claim 31, wherein the at least one entry of the previous drill down level view may be selected by a user to change contents of the management information view back to a corresponding previously displayed management information view.

30 33. A computer system as in claim 21 that additionally performs operations of:

highlighting a subset of drill down options in the drill down menu depending on which of the drill down options may be selected by a user to produce a next displayable drill down view.

- 5     34.     A computer system as in claim 21 that additionally performs operations of:  
             displaying a hierarchy of managed entity icons that may be traversed  
             based on use of a drill down technique; and  
             in relation to at least a portion of the managed entity icons in the  
             hierarchy, providing a display region in relation to the managed entity icons to  
10     receive an input selection by a user of which management information to display  
             for multiple selected managed entities of the network.
35.     A computer system as in claim 21, wherein the drill down menu includes at least  
             two sets of selectable drill down options, a first set of selectable drill down  
15     options related to storage features of a storage area network, a second set of drill  
             down options related to host features of the storage area network.
36.     A computer system as in claim 21 that additionally performs operations of:  
             in relation to the management information view including management  
20     information associated with the at least one managed entity in the network,  
             displaying a detailed view of individually presented management information for  
             each of the at least one managed entities;  
             enabling a user to individually select each of the at least one managed  
             entity in the detailed view; and  
25     wherein producing a drill down view further includes applying the  
             respective drill down function to management information associated with  
             individually selected managed entities displayed in the detailed view.
37.     A computer system for displaying management information views associated with  
30     a storage area network, the computer system comprising:

a processor;

a memory unit that stores instructions associated with an application executed by the processor;

a communication interface that supports communication with nodes of the storage area network; and

an interconnect coupling the processor, the memory unit, and the communication interface, enabling the computer system to execute the application and perform operations of:

on a first portion of a display screen, displaying a vertical hierarchy of selectable icons representing managed entities of a storage area network;

on a second portion of the display screen, displaying a summary view of collective management information associated with at least two selected managed entities of the storage area network;

on a third portion of the display screen, displaying a detailed view of separately listed management information for each of the at least two selected managed entities in the network; and

on a fourth portion of the display screen, displaying a drill down menu including multiple selectable drill down options to drill down with respect to at least a portion of the management information displayed in the detailed view of separately listed management information.

38. A method as in claim 37, wherein displaying a drill down menu includes the operations of:

displaying the drill down menu to include drill down options associated with managed entities in a storage area network, the drill down menu including at least one of the following drill down options to drill down to a corresponding lower level with respect to displayed management information: database, database file, file system, volume group, host device, HBA (Host Bus Adapter), storage device, pool, port/storage group, unallocated devices.

39. A method as in claim 37, wherein the drill down menu includes at least two sets of selectable drill down options, a first set of selectable drill down options related to storage features of the storage area network, a second set of drill down options related to host features of the storage area network.
40. A computer system as in claim 37 that additionally performs operations of:  
on a fifth portion of the display screen, displaying path information including: i) an entry corresponding to a drill down view of presently displayed management information, and ii) at least one selectable entry corresponding to a previously displayed drill down view of management information.
41. A computer program product including a computer-readable medium having instructions stored thereon for processing data information, such that the instructions, when carried out by a processing device, enable the processing device to perform operations of:  
displaying a management information view that includes management information associated with at least one managed entity in a network;  
displaying a drill down menu associated with the management information view, the drill down menu including selectable drill down options that correspond to respective drill down functions selectively applied to the management information associated with the at least one managed entity;  
identifying a selected drill down option chosen from the drill down menu;  
producing a drill down view by applying the respective drill down function associated with the selected drill down option to the management information associated with the at least one managed entity, the produced drill down view including a presentation of the management information based on the applied respective drill down function; and  
displaying the drill down view on the graphical user interface.

42. A computer system for supporting management information views associated with a storage area network, the computer system including:

means for displaying a management information view that includes management information associated with at least one managed entity in a network;

means for displaying a drill down menu associated with the management information view, the drill down menu including selectable drill down options that correspond to respective drill down functions selectively applied to the management information associated with the at least one managed entity;

means for identifying a selected drill down option chosen from the drill down menu;

means for producing a drill down view by applying the respective drill down function associated with the selected drill down option to the management information associated with the at least one managed entity, the produced drill down view including a presentation of the management information based on the applied respective drill down function; and

means for displaying the produced drill down view.